SOIL SURVEY OF POPE COUNTY, ARKANSAS.

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DESCRIPTION OF THE AREA.

Pope County is situated northwest of the center of the State of Arkansas, in the southern part of the Ozark region. It is bounded on the north by Newton and Searcy Counties; on the east by Van Buren and Conway Counties; on the south by Conway, Yell, and Logan Counties, the southern boundary line being the Arkansas River; and on the west by Johnson County. The thirty-fifth parallel of latitude passes about 6 miles south of the southern extremity of the county. The county has an area of 828 square miles, or 529,920 acres.

Pope County includes parts of two important physiographic regions. The northern half lies on the Boston Mountain plateau, the southern in the Arkansas Valley lowland. The Boston Mountain plateau lies at an elevation of about 2,000 feet and has a rolling upland surface, except where it is deeply dissected by the drainage lines. It is underlain by beds of sandstones and shales lying nearly horizontal. Its upper surface descends abruptly on the south to the level of the Arkansas Valley lowland, which lies 600 to 900 feet below the level of the plateau. The dissection of the plateau is practically complete, and the valleys are both deep and narrow. The Arkansas Valley lowland consists of a rolling plain interrupted by a number of isolated, flat-topped mesas or low plateaus, the largest one lying in the southwestern part of the county.

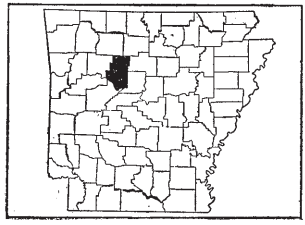

FIG. 32.—Sketch map showing location of the Pope County area, Arkansas.

The boundary between the plateau and the lowland runs east and west about 3 miles north of Scottsville to the county line, 2 miles northeast of Appleton.

Over the lower southern division deeper and more complete erosion than has taken place in the Boston Mountain section has worn down the rocks, leaving a low-lying and less dissected plain. Most of this division of the county is well suited to farming. The widest of the stream bottoms, which are generally level and smooth, are found in this southern part of the county. Elevations above sea level vary

from about 300 feet at the extreme southeastern corner of the county to about 750 feet at the foot of the Boston Mountains.

The drainage, for the most part, flows in a southerly direction and empties into the Arkansas River. Most of the interior country is drained by the Illinois Bayou and its tributaries, namely, the West, Middle, and East Forks, which unite a few miles above Scottsville to form the main stream. Farther south on the east side of the stream are McCoy and Baker Creeks, and on the west side Ross and Mill Creeks. At the western boundary, near Treat, Big Pine Creek enters the county from Johnson County and flows south for 8 or 9 miles and then in a westerly direction along the southern edge of Colony Mountain, until it leaves the county. Its principal tributary is Indian Creek. About 6 miles south of Appleton the West Fork of Point Remove Creek enters the county from the east. It flows south for about 5 miles and reenters Conway County. The principal tributaries of this stream in Pope County are Hackers Fork and Isabell, Gumlog, and White Oak Creeks. A few streams have their source near the northern boundary of the county and flow in a northerly and easterly direction into the White River. Falling Water and Archey are the most important of these streams.

Pope County was originally included in the Indian Territory, and was inhabited by the Cherokee Indians. The county was formed principally from Conway County in 1829, but the present boundary was not established until 1877. Dwight, on the Illinois Bayou, and Norristown, almost opposite Dardanelle, on the Arkansas River, were among the early settlements, and for several years were important trading centers. About 1850 Dover, then the county seat, was the most important town between Fort Smith and Little Rock. The old town of Galla Rock, south of Atkins, on the Arkansas River, was an important trading center, goods being transported by water. However, with the building of the railroad now known as the St. Louis, Iron Mountain & Southern in 1873 Russellville and Atkins became the most important towns in the county. Russellville was made the county seat in 1877.

The majority of the early settlers came from the Southern States. At present there are many Germans in the county, with important settlements near Augsburg and in the vicinity of Colony Mountain. The negro population of the county is not very large, and is confined entirely to the region east of the Illinois Bayou and south of the railroad, with the exception of a small number located northeast of Atkins.

The population of the county, as given by the 1910 census, is 24,527. This number is gradually increasing. The southern part

of the county is well occupied by farms, but in the northern and more mountainous section there are considerable areas which are rather sparsely settled.

Russellville, the county seat, has a population of about 3,000, and is the chief business center of the county. One of the four State agricultural schools of Arkansas is located here, together with a high school and graded schools. The chief industries are a box and canning factory and a cottonseed oil mill. There are several anthracite coal mines in operation within a radius of about 3 miles of the town. The next largest town, Atkins, has a population of about 1,500, and is an important commercial point. Other towns of local importance are Dover, Pottsville, and London. A number of smaller towns are distributed throughout the county.

School facilities are fair over the greater part of the county, except in the northern mountain districts. The county is fairly well supplied with telephone lines, and the southern part with the rural delivery of mail.

Only a small part of the county has good transportation facilities. The St. Louis, Iron Mountain & Southern Railroad, belonging to the Missouri Pacific system, crosses the southern part of the county in an east-and-west direction. A long and laborious haul is necessary in order to market products from the northern part of the county. It is planned to construct a railroad from Russellville to Dover and Scottsville, with the intention ultimately to continue the road northward through the mountains to join the Missouri & North Arkansas Railroad. Another survey has been made for a railroad to pass east and west through the county, near the foot of the Boston Mountains. Improvements of this character would give a great stimulus to the agricultural development of northern Pope County, particularly in connection with the fruit-growing industry. The Dardanelle & Russellville Railroad is a short branch line connecting Russellville and North Dardanelle, on the Arkansas River. A pontoon bridge connects the latter place with Dardanelle, Yell County.

The roads connecting some of the larger towns are kept in fairly good condition, but many of the roads of the county, especially during the winter months, are almost impassable. The mountain roads are generally rough and stony and wash badly during heavy rains.

Cotton and cotton seed are the most important products shipped from the county. Yellow-pine lumber and oak barrel staves are an important source of revenue in the mountains. Peaches are shipped in large quantities, and some apples are also marketed. The chief markets are St. Louis, Kansas City, Memphis, and Little Rock.

CLIMATE.

The temperature and rainfall in Pope County are generally quite uniform. The average precipitation of 46.04 inches is well distributed throughout the year. The mean precipitation for the winter is 9.34 inches; for the spring, 13.85 inches; for the summer, 12.1 inches; and for the fall, 10.75 inches. There are occasional years of extremely light or heavy rainfall, the Weather Bureau records showing a precipitation of 31.24 inches for the driest year and 63.69 inches for the wettest year recorded. In only a few seasons, however, are crops seriously damaged by too scant or too abundant rainfall.

In general, the temperature of the county is mild, a mean annual temperature of 60.7° F. being recorded by the Weather Bureau station at Russellville. An absolute maximum temperature of 107° F. and an absolute minimum temperature of —15° F. have been recorded, but extreme temperatures approaching these figures are rare. There is a very light snowfall during the winter, and during the coldest winter months the ground freezes to a depth of only a few inches.

The average date of the first killing frost in the fall is October 28 and of the last killing frost in the spring April 5. This gives a normal growing season of 206 days, which is quite ample for the maturity of all staple crops grown. The date of the earliest killing frost recorded in the fall is October 9 and of the latest in the spring May 1.

In the Boston Mountain region, in the northern part of the county, and also on the outlying mountains farther south, such as Colony, Buck, Iron Ore, and Carrion Crow Mountains, the altitude causes considerable variation from the above figures. The elevations range from 300 to 2,150 feet, and in the highest areas the spring season is 10 days to 2 weeks later than in the valleys, while the fall season is about as much earlier.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded at the Weather Bureau station at Russellville:

Normal monthly, seasonal, and annual temperature and precipitation at Russellville.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	42.3	86	7	2.95	4.41	4.21
January	39.1	78	− 6	3.44	1.71	5.75
February	40.1	82	−15	2.95	1.69	3.48
Winter	40.5			9.34	7.81	13.44
March	52.3	90	15	4.76	6.38	3.99
April	61.8	92	29	3.54	1.85	3.65
May	69.9	97	32	5.55	1.94	10.31
Spring	61.3			13.85	10.17	17.95
June	77.3	104	37	4.17	2.40	6.66
July	81.3	106	56	4.39	3.01	6.39
August	79.7	107	46	3.54	2.24	7.86
Summer	79.4			12.10	7.65	20.91
September	73.4	102	36	4.14	.89	5.30
October	61.2	92	27	2.73	2.18	2.64
November	49.8	87	14	3.88	2.54	3.45
Fall	61.5			10.75	5.61	11.39
Year	60.7	107	−15	46.04	31.24	63.69

AGRICULTURE.

Immediately after the settlement of Pope County agriculture became the chief industry. The settlers followed few other occupations, and, with the exception of some income derived from hunting and trapping, the tilling of the soil was the chief means of subsistence. The county was forested, and fields were prepared by deadening the standing timber, after which crops were grown on the partly cleared land. Subsequently the timber was removed and the land made wholly available for cultivation. This practice is still followed in clearing new land.

In the early history of the county farming was carried on mainly with oxen. Nearly all the implements, wagons, and other farm equipment were made in local shops. Clothing was made from the home-grown cotton and some wool was produced for home needs.

Transportation facilities, prior to the advent of the railroad, were meager. Products were hauled long distances overland in wagons. The river was also used for transporting crops and bringing in supplies.

The earliest crops grown were mainly corn, wheat, some oats and cotton, and a fair variety of vegetables. These were produced primarily to supply home needs. The long hauls to markets discouraged the growing of surplus crops. A few hogs and cattle were kept on the farms for home use, although some of these were sold occasionally to drovers.

The gradual progress of the county was interrupted by the Civil War. In 1873 the Little Rock & Fort Smith Railroad, now the St. Louis, Iron Mountain & Southern Railroad, of the Missouri Pacific system, was built through the county, and this gave a stimulus to farming and related industries. The population steadily increased, and the area of farm land was extended. In 1880 the census gave 168,245 acres in farms, of which 65,635 acres were improved. A total of 2,098 farms was reported. The available farm acreage has gradually increased. In the census of 1910, 290,516 acres are reported in farms, with 144,886 acres improved. The average size of farms is given as about 76 acres.

After the improvement of transportation facilities, farmers began to give more attention to growing cotton for market, and this soon became the chief money crop of the county. Cotton, having a ready market, and generally being remunerative, is still the most important crop grown. Other crops, particularly wheat, which previously was a crop of some importance, gradually declined in acreage.

At present nearly all the farm practices are directed toward the production of cotton, and other crops generally are subordinate. Cotton is grown on nearly all types of soil in the southern half of the county and, to some extent, on the better stream bottoms in the northern mountainous section. On the Boston Mountains the elevation and climate are unfavorable for the successful maturing of the crop. Much labor and expense is required in growing this crop. The 1910 census reports a production of 16,027 bales of cotton from 47,567 acres.

Many farmers use commercial fertilizers with good results. Very little care is exercised in the selection of seed, the growers depending on mixed seed of unknown quality.

There is a tendency to use the land continuously for cotton or to grow this crop for at least a number of years in succession. There is no doubt that on many of the soils, more particularly the upland types, the land is deteriorating because of this continuous cropping to cotton. The average yield for the county is between one-third and one-half bale per acre. There is a need for rational cropping systems, whereby the land may be utilized in producing a greater variety of crops, particularly with the view of maintaining and increasing the supply of organic matter in the soils.

Corn ranks next to cotton in importance. The 1910 census reports a total of 46,394 acres in corn, with a yield of 776,326 bushels. In the last three decades the acreage devoted to corn has nearly doubled. Corn is grown on practically all types of soil throughout the county, the yields varying with the adaptability of each soil to the crop. Best results are obtained on the well-drained alluvial bottom soils. All the corn grown is consumed in the county, and frequently the supply produced is not sufficient to meet local needs.

The crop is ordinarily planted in rows 3 to 4 feet apart with horse planters, the stand subsequently being thinned so that the stalks are about 20 to 24 inches apart. The ear corn is harvested in the shuck by gathering from the standing stalks, and hauled directly to the crib. The stalks are left standing, and before preparing the land for the next crop they are leveled with a stalk cutter. The corn stover is nearly always saved, either by removing the top of the stalk above the ear when the latter is nearly mature or by stripping or "pulling" the leaves, which are tied in bundles and stored for subsequent use.

Both yellow and white dent corn are grown, the latter predominating. The present low average yields may be easily increased by more carefully selecting and testing the seed. It is necessary to cultivate the corn crop frequently in order to retain soil moisture throughout the growing season. After the first cultivation the better method is to practice shallow cultivation, so as not to injure the feeding roots of the corn plant, which are near the surface.

Oats are grown in a small way. The 1910 census reports a total of 2,837 acres, yielding 35,531 bushels. The crop is grown both as winter (fall sown) and as spring-sown oats. There is an impression that the winter oats do better. They do have the advantage of acting as a cover crop through the winter season. Since the oat crop fits well in a rotation and the grain makes a valuable ration for live stock, the extension of the acreage in this crop is advantageous.

Wheat formerly was grown more extensively than at present, but owing to the small average yields secured and the increasing interest in cotton production it now receives very little attention. In 1909 wheat was grown on only 373 acres, with a total yield of 2,147 bushels. Wheat is a winter crop, and is sown usually some time during October. The indications are that the soils of the county are not well adapted to wheat, but with better fertilization and preparation of the land good yields may be obtained. It is a convenient crop for the rotation and also serves as a winter cover crop.

Rye is seldom grown except to provide winter pasturage or as a cover crop. It is a valuable crop for these purposes. Sorghum is grown by nearly every farmer on nearly all types of soil, the sirup produced being consumed at home. Sorghum is also grown to some

extent as a forage crop. Kafir and milo are grown in an experimental way by a few farmers.

On some of the alluvial types, particularly on the sandy Yahola soils, alfalfa is grown successfully. At present the acreage is small, but there are many locations on these soil types suitable to the extension of this crop. So far as could be learned, alfalfa has not been grown on the Pope soils, although the fine sandy loam in particular seems well adapted to it. On the upland soils, particularly those of the Hanceville series, it is doubtful if this crop would be generally successful, though in carefully selected areas, where the drainage is good and the soil reasonably deep and of good fertility, it probably could be grown with fair results, especially with liberal applications of lime. The Hanceville soils in general appear to be deficient in lime, and in most cases are low in humus and organic matter. If these requirements are met and the soil properly inoculated, it seems that alfalfa should succeed. It is essential that the land be productive, free from weeds and grass, and well drained.

Clovers, especially red clover, are not generally successful, though no thorough experiments have been conducted. Japan clover, or lespedeza, while not native, has in many localities become established voluntarily, and improves the quality of pasture lands. Rape, soy beans, and vetch also are grown, and the extensive use of these crops is highly beneficial.

Timothy has been tried, but is not successful, the climate apparently not being suited to its development. Bermuda grass thrives on most of the soils, and is a valuable crop for pasture grass and to some extent for hay. As most of the cleared land is desired for cropping and very little land is needed for pastures for the rather small number of live stock kept, Bermuda grass is often regarded as a pest. With its underground method of propagation, it is difficult to remove when once it becomes established. Redtop succeeds on most of the upland types, but is not generally grown.

Cowpeas are grown in a small way by nearly every farmer for forage and hay, to some extent for pasturage for cattle or hogs, and also for the seed. The crop is both broadcasted alone and grown with corn, being planted during the last cultivation. No particular trouble is experienced in getting a stand, and its value as a soil improver warrants the extension of the crop. The clovers do not always succeed, but cowpeas supplant this lack of adaptation very well. They add nitrogen and humus to the soil and improve its physical condition. In order to more rapidly increase the humus content, where it is very low, the turning under of the entire growth is advisable. The Whippoorwill variety is commonly sown. Peanuts are grown in a few small patches.

Both Irish and sweet potatoes are grown, mainly in small quantities for home use. A few farmers grow sweet potatoes on a commercial scale. In 1909 a total of 570 acres was devoted to Irish potatoes, with a yield of 43,741 bushels. A production of 19,759 bushels of sweet potatoes on farms from 279 acres is reported.

Of the specialized farm industries, fruit growing is the most important. Considerable attention is given to the production of peaches and, to some extent, to apples. Peach and apple orchards are located principally on the Hanceville soils of the southern part of the county, and are generally successful, particularly on the isolated mountain elevations and hilly locations of this section. There are very few large orchards, though orchards of 30 to 40 acres are quite common. Peaches are not grown commercially on the Boston Mountains and apples only to a limited extent, although the latter do very well on many of the well-drained soils of this region. Most of the orchards are on the Hanceville fine sandy loam, though good results are secured on the Hanceville loam and shale loam.

The principal variety of peach is the Elberta. A few of the Early Wheeler and some miscellaneous varieties are grown. The Elberta peaches begin to mature about July 20, and the picking season lasts until the first week in August. Most of the fruit is packed for market in bushel baskets, but a few growers use the oblong crate. The greater part of the crop is shipped from Russellville to St. Louis and Kansas City.

A much smaller quantity of apples than peaches is shipped from the county, and none in carload lots. A few growers make private shipments to Little Rock and to northern points. Several varieties of apples are grown. The Ben Davis, Arkansas, Winesap, and Rome Beauty are the most popular. Several other varieties are being introduced.

Not many orchardists are giving their plantings more than ordinary attention. A few spray with lime-sulphur and Bordeaux mixture and are giving some attention to intertillage, but many orchards show neglect in these respects as well as in pruning and fertilization.

In a small way plums, pears, and such berry fruits as raspberries, blackberries, and currants are grown, mainly for home use. Strawberries constitute a profitable crop. In the southern part of the county strawberries are grown in patches of one to two or more acres each. Most of the strawberries are grown on the Hanceville fine sandy loam, but most of the other well-drained soils are also well adapted to this crop. The production of strawberries offers excellent opportunities, but the crop requires quite intensive cultivation and can not be grown on a larger acreage than can be given proper attention. The strawberries are sold mainly at local markets.

There are a few small vineyards in Pope County, and the indications are that the climate and many of the soils of the county are well suited to certain varieties of grapes. The Hanceville fine sandy loam is generally selected for the vineyards. Some of the surplus product is made into wine.

The dairy industry is subordinate in Pope County, although nearly every farmer keeps one or two cows to supply home needs, and surplus butter is exchanged for other provisions. In the vicinity of Russellville a few small dairies having 8 to 12 cows each supply milk and cream to this market. The dairy stock usually is of mixed breed, but some purebred and grade Jerseys and Holsteins are kept. There are only two or three silos in the county. There is apparently no reason why this industry should not be greatly extended, as dairy products are usually in demand and command good prices. In addition the keeping of live stock is especially needed to increase the supply of manure for use on the cultivated fields. The development of dairying would necessitate the establishment of creameries to prepare the dairy products for market.

Some horses and mules are raised, but the supply does not meet the local demand. Nearly every year mules are shipped into the county for work stock. A few hogs are usually raised to provide meat for home use, although the supply of pork is usually inadequate for local demands. A few sheep are kept, and, in the rougher areas and the mountain districts, an occasional herd of goats. A small number of chickens and occasionally ducks, geese, and turkeys are raised by nearly every farmer. No special attention is given to poultry raising, which is incidental to general farming. Bees are kept on some of the farms. The value of the live stock in Pope County is given by the 1910 census as $1,161,794.

While cotton and corn are grown on nearly all the arable soils, farmers generally recognize the differences in the soils with respect to their adaptation to the various crops grown. The Hanceville fine sandy loam and the more elevated areas of its low phase are generally recognized as the best soils for peaches and apples. The better drained Arkansas River bottom soils have been found best suited to alfalfa, as this crop grows there with but little difficulty in getting a satisfactory stand. The Conway silt loam and especially the Atkins silt loam, owing to their poor drainage, are largely set aside for meadows and pastures.

Regular crop rotations are not common in the county. A few farmers alternate corn with cotton, and grow oats or wheat occasionally, as well as cowpeas, soy beans, or rye, and get good results in maintaining the fertility of the soil and in securing satisfactory crop yields. The most essential point in rotations is to include an occasional crop to turn under, preferably a legume.

Farm practices in general have shown a gradual improvement in the last few decades. The old bull-tongue plow is now seldom used and in its place the heavier turning plow is employed. Some farmers use the double-shovel or "middle-buster" plow in preparing the land, especially when the field is not weedy and is in fairly good tilth. While the use of this implement is a rapid means of preparing the land, it has the disadvantage of not loosening the soil deeply or thoroughly enough for the best seed bed. The double-shovel plow is used quite extensively for bedding land for cotton and frequently for corn. A few farmers use the small one-horse turn plow for intertillage, though others are taking up the use of multiple-tooth or harrowlike cultivators. Some wheel cultivators are being used. Much of the land receives insufficient preparation, in that the soil is not plowed to a proper depth and pulverized into a sufficiently mellow seed bed. It is necessary to break the land on practically all soils to a depth of at least 6 or 7 inches to give the best results, and to increase the depth of plowing gradually in successive plowings. Subsoiling often would be beneficial, especially in connection with fall-plowed land.

As a rule, what stable manure is produced is utilized to advantage, but with the small number of live stock kept, the amount is far from sufficient to maintain the productiveness of the land. Some commercial fertilizers are used, nearly all being applied to the cotton crop. The 1910 census reports an expenditure of $3,755 for fertilizers in the county in 1909. Their use is gradually increasing.

The average farm house is small. The barns are also comparatively small, but are usually sufficiently large to house all the live stock kept and to store a suitable supply of hay and fodder. Should the live-stock industry, particularly dairying, become more extended, a larger barn capacity would be generally needed. The farms are not fenced in their entirety, but lands set aside for pasture are inclosed with fences of wire or of rails. In the southern part of the county certain areas have been formed into districts, which are surrounded by strong fencing, and in which the farmers agree to keep all live stock, so that it is not necessary to fence the cultivated lands.

Farm labor is not plentiful, but is usually adequate to meet ordinary demands. Monthly wages for farm labor vary from $18 to $25, with board, depending upon the experience and efficiency of the laborers. Day laborers are paid from $1 to $1.25. During the cotton-picking season much labor is secured from the mountain districts. Cotton pickers are paid by the hundred pounds of seed cotton, usually 50 to 80 cents. In 1909 a total expenditure of $77,467 for farm labor is reported.

A little over half the farms are operated by the owners. This percentage has gradually declined during the last three decades. The average size of the farms is about 76 acres, although 30 to 40 acres is about the usual size where the land is worked intensively. The usual share rent is one-third of the corn and one-fourth of the cotton produced, the tenant furnishing tools and work stock. The landlord generally pays for one-fourth of the fertilizers. Very little land is rented for cash. Where this system is practiced the farms are usually rented for $5 to $6 per acre, and sometimes for as much as $10.

The extension of the dairy industry, together with the raising of beef cattle and horses and mules, offers excellent opportunities, and would materially improve the general agricultural conditions of the county. There are many farms in the county which are producing unprofitable crops of cotton and corn and which are better suited to the production of hay and forage crops. By making such use of these lands live stock could be raised profitably where cotton and corn are now grown at a loss.

Most of the soils, particularly the upland types, are in need of lime, which is the chief requirement for the successful growing of legumes, such as alfalfa, clover, or hairy vetch. Lime also is useful in improving the structure of some of the heavier-textured soils, such as the Hanceville loam and Conway silt loam.

The use of commercial fertilizers is becoming more popular, but it is necessary to exercise care in this direction. Where green manuring crops, particularly the legumes, are grown regularly, less of the nitrogen constituent of the fertilizer will be needed. In many cases it may be found that a fertilizer consisting principally of phosphoric acid or potash, or both, will prove most satisfactory.

SOILS.

The soils of Pope County, classified according to mode of origin, fall into two groups—the residual, which includes all of the upland soils, and the alluvial stream-bottom soils.

The rocks from which the residual soils are derived are sandstones and shales, which are formed from sediments laid down in the sea during Devonian and Carboniferous times. At the close of these periods—about the end of the Paleozoic Era—the formations were lifted above the level of the sea. Subsequently erosion and other natural agencies cut down the formations, leaving the more or less dissected topography, with the mountains and intervening stream valleys.

The rock strata of most of the county lie in a nearly horizontal position. Toward the southern boundary the strata dip in a general

way in a synclinal fold beneath the Arkansas River, reappearing south of the valley in the Ouachita ranges. In the southern part of the county, mainly south of the railroad, there are distinct evidences of minor foldings, which may account for the several low, stony-crested ridges usually extending in an east and west direction.

In the breaking down of the rock formations there has accumulated a mass of loose residue, which enters into the composition of the soils. The coarser grained, more siliceous rocks or sandstones give rise to the upland sandy loam soils, while the alternating shale and shaly sandstone strata have produced the heavier textured loam and silt loam soils. The first-named class of rocks belongs to the Millstone grit formation and the latter class of rocks belongs to the Coal Measures, which are composed largely of fine-grained materials.

The alluvial soils, which have been deposited by stream waters, are separated into two classes on the basis of the origin of their materials—the bottom soils of the upland streams and the bottom soils of the Arkansas River. The soils of the former division consist of accumulations of sandstone and shale materials which have been washed from the uplands of the county and from similar soils of adjoining counties. The Arkansas River soils differ from these in having a greater variety of materials entering into their composition. As this river has its source several hundred miles to the west in the eastern slopes of the Rocky Mountains in Colorado, its waters, with those of its tributaries, have carried down a wide variety of materials. These include sediments from the distant arid and semiarid regions and some materials from the near-by humid regions. A distinguishing characteristic of these Arkansas River soils is their chocolate-red color, which is due to an admixture of sediments from the Permian Red Beds of the Great Plains region. While the red color is evident, it is not so intense as is observed in the alluvial soils farther up the river, closer to the Red Bed formations. In Pope County the soils are darker, owing to the addition of darker-colored sediments carried by local tributary streams from the Ozark soils. The first or overflowed bottom soils have been derived separately from the second bottoms, a terrace soil standing above overflow.

In the classification of the soils of the county, seven upland soil types, including Rough stony land, are recognized. Five types belong to the Hanceville series and one to the Conway series. Of the Hanceville soils the stony loam, shale loam, fine sandy loam, very fine sandy loam, and loam are mapped. The stony loam, fine sandy loam, and loam each have a low phase which has been separated from the higher lying, more nearly typical mountain soil, and these are shown on the accompanying map by cross lining. These phases are mapped in the

lower southern half of the county, where the soils have not so great an elevation and are more accessible, generally smoother and somewhat more productive. Better farms, as a rule, are located on the phases. The Conway series is represented by the Conway silt loam.

The upland stream-bottom soils have been correlated as the Pope and Atkins on the first bottoms and Waynesboro on the second bottoms or terraces. The Pope series has five members, the stony loam, sandy loam, fine sandy loam, loam, and silt loam. But one Atkins soil, the silt loam, is mapped. Of the Waynesboro series, the stony loam and loam are recognized.

The Pope and Atkins soils differ from the Huntington and Holly soils in that they do not have any limestone material in their composition.

The alluvial soils bordering the Arkansas River are included in six series, the Yahola, Bastrop, and Osage on the first bottoms, and the Reinach, Brewer, and Muskogee on the second bottoms. Besides the soil types considered in these series, two nonagricultural types, Riverwash and Rough stony land, are mapped.

Two small areas are mapped as lakes, one to the south of Atkins and another southeast of Russellville. These lakes are shallow and contain quantities of water varying with the season. They are situated on the second bottoms of the Arkansas River, adjoining the uplands, where they get their supply of water from small upland streams. The lake land south of Atkins is covered with a growth of cypress and that southeast of Russellville supports water-loving trees, chiefly tupelo gum.

The soils of the county thus formed have been separated into types based on a field examination of their texture, structure, color, depth, drainage, and general availability for agricultural purposes. These types are grouped into series according to their origin, source of the material, color, and topographic position.

The various soils of Pope County are described in detail in the following chapters. The accompanying map shows the location and extent of the various types.

The following table gives the names of the several soil types and their actual and relative extent:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Hanceville fine sandy loam	61,184	22.7	Brewer clay	3,904	0.7
Low phase	58,624		Reinach very fine sandy loam	3,584	.7
Hanceville stony loam	14,400	22.3	Pope loam	3,392	.6
Low phase	103,744		Yahola silt loam	2,112	.4
Rough stony land	90,304	17.1	Brewer very fine sandy loam	2,112	.4
Hanceville loam	21,184	7.4	Bastrop clay	1,728	.3
Low phase	18,240		Reinach silt loam	1,472	.3
Hanceville shale loam	37,312	7.0	Yahola very fine sand	1,280	.2
Conway silt loam	33,792	6.4	Riverwash	1,024	.2
Hanceville very fine sandy loam	18,176	3.4	Brewer silt loam	832	.2
Pope silt loam	12,032	2.3	Waynesboro stony loam	832	.2
Pope fine sandy loam	8,064	1.5	Muskogee very fine sandy loam	768	.1
Waynesboro loam	6,464	1.2	Reinach fine sand	448	.1
Pope sandy loam	4,864	.9	Yahola fine sand	320	.1
Muskogee silt loam	4,736	.9	Osage silt loam	192	.1
Atkins silt loam	4,480	.8			
Yahola very fine sandy loam	4,416	.8	Total	529,920	
Pope stony loam	3,904	.7			

HANCEVILLE SERIES.

The Hanceville series comprises light-brown to reddish-brown surface soils, with red and moderately friable subsoils. These soils are derived from sandstones and shales, which, in places, appear to be lighter in iron-bearing minerals than the rocks giving rise to the Dekalb soils.

HANCEVILLE STONY LOAM.

The Hanceville stony loam is a brownish or grayish-brown silt loam to loam, underlain at about 5 to 8 inches either by yellowish silt loam or loam passing below into red to reddish-yellow stiff clay or red, friable to moderately stiff clay. The characteristics of the soil, as a whole, are not very uniform, depending on the varying surface features which are common to this type. Minor sandy and gravelly areas occur with no apparent regularity. Shallow areas and minor rock outcrops are common. Sandstone fragments are scattered irregularly over the surface in sufficient quantities to interfere with cultivation.

In its smoother areas this type approaches the Hanceville loam in soil characteristics and crop value, and the rougher and steeper areas closely approach the Rough stony land, and in many instances are difficult to distinguish from it. This latter phase, because of its rough and rugged nature, has a low agricultural value.

The Hanceville stony loam typically occupies large areas well distributed over the northern part of the county. It is found on the

more gentle and smoother slopes, and on some of the rolling mountain tops and ridges; and on some of the valley slopes there are areas which, as distinguished from the nonagricultural Rough stony land, are suited to some extent to cropping and fruit growing. The slopes, however, are largely so steep that any attempt to utilize the land intensively and regularly would likely result in destructive erosion unless the land were protected by extensive terracing. Frequently there are along the slopes benches from one-fourth to one-half mile or more long and from 1 to 3 rods wide which are level and smooth and on which the soil material is really the Hanceville loam. As these areas are too small to be satisfactorily outlined on the soil map, they are included with the main body of the Hanceville stony loam.

The material of this type is residual from the associated fine-grained sandstone and shaly rocks. The resistant nature of most of the rock has retarded weathering, so that the more durable fragments remain as a part of the soil mass. On many of the slopes the stony nature has been brought about, at least in part, by the falling down of fragments. Also the colluvial movement of the finer soil particles has brought down much of the material.

Comparatively little of this land is utilized for agriculture. As its prospective crop value is limited by its stony and rugged nature, most of it has remained under control of the Government and is now managed by the National Forest Service. It is mainly forested with such timber as white, black, and red oak, black gum, hickory, dogwood, yellow pine, and elm. Until the demand for more land for farming becomes much greater than at present, it is probable that most of this land will be used only for forestry. It could not be cultivated profitably under existing economic conditions.

Hanceville stony loam, low phase.—The soil of the low phase of the Hanceville stony loam has much the same characteristics as the typical mountain development of the type. As generally found it consists of a brown loam or silty loam about 6 to 8 inches deep, underlain by a sandy, friable, red clay, which passes downward into compact, fairly stiff red clay. Scattered over the surface and mixed with both soil and subsoil are brown sandstone and shaly sandstone fragments in sufficient quantities to interfere materially with tillage operations. In a few small areas there is only a shallow soil covering over the bedrock. Most of these places are forested, and they can generally be recognized by the low, scrubby growth of timber. This phase occurs mostly on slopes and on the crests of narrow ridges.

In a few localities the soil, except for its stony nature, is similar to the Hanceville fine sandy loam. This variation is more nearly a stony fine sandy loam. The chief examples of this development

occur on Pea Ridge and about the slopes of the lower benches of Iron Ore Mountain.

The low phase of the Hanceville stony loam is distributed in small areas over most of the upland part of the southern half of the county. It is more prevalent toward the east, where it occurs in the largest areas. It occupies the smoother of the rough slopes and low ridges, and in some cases the crests of these ridges.

Only a small part of this soil is used for cultivated crops. Most of the phase supports a growth of timber of about the same varieties as the typical development. Some of the more nearly level and less stony locations have been cleared and are used for general farming, and many of these are very well suited to this purpose. Generally, the larger rock fragments have been removed and piled in the fields or used in constructing fences.

This is regarded as a fairly strong soil, and crop yields are about the same as those obtained on the Hanceville loam and fine sandy loam types. The low phase is probably best adapted to fruit growing. Apples, grapes, and peaches show good results. Berry fruits, such as blackberries, raspberries, currants, and gooseberries, do well.

The average value of this land is low, owing to its rough nature and its inaccessibility to the railroad and markets.

HANCEVILLE SHALE LOAM.

The surface soil of the Hanceville shale loam consists of a brown to slightly reddish brown loam or silty loam from 5 to 6 inches deep. Below this the subsoil soon becomes a yellowish-red to red, moderately friable to rather stiff, fairly heavy clay. At about 18 inches the material generally is a deep-red stiff clay. The surface is characterized by the presence of moderate quantities of small shale fragments, and some larger fragments of fine-grained sandstone commonly occur. These fragments also are disseminated more or less thoroughly throughout the soil mass, the quantity usually becoming more abundant with increase in depth. Where the shale is most prevalent, the parent rock usually is encountered at a depth of about 30 to 36 inches.

Within the larger areas there frequently occur narrow strips and small patches, low-lying and poorly drained, in which the soil has much the same physical characteristics as the Conway silt loam. These tracts are not well suited to tillage, but they support a fair growth of grass, usually wild grasses, but sometimes Bermuda and lespedeza (Japan clover). This phase is valuable in affording a supply of hay and pasturage. The higher lying and more typical areas support very little natural grass suited for hay, and do not afford very desirable pasturage.

This soil is found only in the southern, lower-lying division of the county. It is not found in many large bodies. The largest continuous areas are located east of Scottsville and southwest of Dover. Farther to the south it is found in strips and small disconnected areas. It often occurs on slight elevations rising from the lower lying areas of Conway silt loam.

The type is characteristically developed on low ridges and knolls and along the lower slopes of the plateaulike mountains. It has a sloping to somewhat rolling surface, but usually is not subject to destructive washing in fields where careful methods of farming are pursued.

The soil material is residual from dark-colored shales and thin-bedded sandstone.

A large part of the area of this soil is under cultivation. Some of the more sloping and slightly more broken areas yet remain in native forest. The usual crops of cotton, corn, sorghum, cowpeas, and sweet potatoes are grown, the yields and methods being essentially the same as on the Hanceville loam. Owing to a considerably greater content of shale, crops on the Hanceville shale loam are slightly more subject to ill effects from droughts. Special care is necessary in preparing this land. It must be plowed deeply and the surface kept well mulched by frequent cultivation.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Hanceville shale loam:

Mechanical analyses of Hanceville shale loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460731	Soil	1.9	2.1	1.1	2.4	32.0	47.2	13.4
460732	Subsoil	3.4	4.5	1.6	2.6	26.9	45.3	15.7

HANCEVILLE FINE SANDY LOAM.

The soil of the Hanceville fine sandy loam consists of a grayish-brown to brown fine sandy loam, with frequently a high silt content, about 8 to 10 inches deep. This is underlain by a yellowish-red or reddish-brown fine sandy clay, which rapidly becomes heavier with increase in depth. At about 16 to 20 inches the subsoil consists of a brick-red to yellowish-red, dense clay. Below about 24 inches the color generally is more yellowish, and occasionally slight drab or ocherous-yellow mottlings are present. At 30 to 36 inches partially decomposed rock is often encountered, and frequently solid rock is reached within the 3-foot depth. This shallowness does not seem to

make the soil droughty, as farmers state that crops do not suffer during droughts as much as on the related heavier textured soils.

Both surface soil and subsoil frequently contain varying quantities of angular sandstone fragments, which are sometimes plentiful enough to impart a distinct gravelly character to the type. Larger fragments of sandstone are often present, particularly on slopes and on areas where the soil forms a thin mantle over the rock.

The Hanceville fine sandy loam occurs typically only on the higher elevations in the county. It has a small development in the Boston Mountain section of the county, usually occurring in small detached bodies. The largest area in the Boston Mountains is in the vicinity of Okay, extending eastward into Van Buren County. To the south of these mountains this soil occupies all the plateaulike mountain tops, rising above the usual level of the smoother southern section of the county. The most important of these are Carrion Crow, Norristown, Buck, Iron Ore, Lee, Tucker, and Colony Mountains.

The surface varies from level and undulating to gently rolling, but in places the type is dissected by small ravines and depressions of drainage courses. The surface configuration is in sharp contrast with the steep mountain slopes leading to the lower lying country. The type is well drained, and it is only in some of the few low depressions that there is an excess of moisture.

This soil is derived from the weathering and decomposition of the fine-grained brownish to grayish underlying sandstones. These rocks seem to break down rather uniformly, giving a smooth, fine-textured soil. The less uniform weathering of the more ferruginous rocks accounts largely for the gravelly and stony content of the soil.

A part of the type is yet in native forest, consisting largely of white, post, blackjack, and black oak and hickory. Sassafras and persimmon are common in places and in some fields sprouts from these become troublesome in cultivating crops. As a rule the smoother and more desirable areas are cleared and regularly utilized for farming.

Corn and cotton are the principal crops grown. These are supplemented by oats, and occasionally wheat and cowpeas. Corn yields from about 15 to 25 bushels per acre, cotton one-half to three-fourths bale, oats 20 to 25 bushels, and wheat from 20 to 30 bushels. Sorghum, peanuts, sweet and Irish potatoes, and cabbage are grown in a small way. This soil is well suited to vegetables and garden truck. In some localities, particularly on Norristown Mountain, the growing of strawberries and grapes has some importance.

The adaptability of this soil to peaches and, to a lesser extent, to apples is recognized, and it is quite extensively used for fruit production. On Carrion Crow Mountain there are many peach and

apple orchards of 50 to 100 acres or more. Peaches do better than apples and receive greater attention. The Elberta is the chief variety. With careful attention to cultivation, spraying, and pruning apples constitute a successful and profitable crop.

Not many farmers practice well-defined crop rotations. Some follow cotton with corn and sometimes corn with cowpeas. The land is broken with the turning plow, though sometimes where the field is not weedy and is in a fairly friable condition it is prepared with the double-shovel plow. Four to six cultivations are given. But little commercial fertilizer is used. What little stable manure is available is generally applied to the fields. To improve the soil cowpeas are often grown between corn rows. Sometimes this crop is grown separately for this purpose, as well as for the seed and for forage.

The soil is low in humus. The growing of cowpeas has been found very helpful in correcting this deficiency. Other legumes and rye could also be used to advantage whenever they can be successfully grown.

Largely because of the inaccessibility of this type, its selling price is low. Cleared land with fair improvements can be bought for $10 to $15 an acre. The best improved land, especially that set with orchards, brings from $25 to $30 an acre.

Hanceville fine sandy loam, low phase.—The low phase of the Hanceville fine sandy loam consists of a brown or reddish-brown to brownish-gray fine sandy loam, underlain at about 8 to 10 inches by light-red or yellowish-red fine sandy clay loam, which quickly grades into brick-red to yellowish-red, fairly stiff clay. The soil and subsoil generally contain some angular sandstone gravel and often larger sandstone fragments. The bedrock in most places, particularly in the broader and smoother areas, is more than 3 feet from the surface. On some of the slopes where erosion has been more active the soil covering is quite shallow, and occasionally the rock is exposed. In these places the soil is sometimes stony, rough, and not very desirable for cultivation.

This phase is more extensive than the more elevated typical areas of the type. It includes all areas approximately below the 750-foot elevation line. It occurs in all parts of the southern half of the county in regions of moderate elevation. Some of the typical areas lie between Dover and Moreland and on Pless Mountain.

The surface is gently rolling to rolling or somewhat hilly. A large part of the low phase is smooth and well suited to cultivation. In general, it is more accessible than the higher typical soil. Good drainage prevails and any excess of moisture from rains soon passes away.

The material is residual from sandstone. The phase supports vegetation, as does the typical Hanceville fine sandy loam. Such trees as black gum, dogwood, and pine, however, are rather more common than on the typical soil.

A large part of this phase is being utilized for general farming. The land is better farmed as a rule than the higher lying areas of typical soil. Cotton and corn are the chief crops. Cotton seems to do somewhat better than on the typical areas. Cotton yields from about two-thirds to one bale per acre during favorable seasons and with proper care in cultivating and fertilizing. Corn generally is a successful crop. It does not make a very rank growth of stalk as a rule, but the grain is firm and of good quality. From about 20 to 35 bushels per acre is considered a good yield. Occasional yields of 40 and 50 bushels are reported, but these are made on small, well-managed fields. Almost every farmer grows some cowpeas, either between the corn rows or as a separate crop for forage. Cowpeas and sorghum are the chief forage crops, and are depended on to a considerable extent for the hay needed for use in the winter. Oats and wheat are minor crops and are produced in practically all cases for consumption on the farm. Oats yield from about 15 to 25 bushels, with some fields producing as high as 40 to 45 bushels per acre. Very little wheat is grown, the yields ranging from 20 to 25 bushels per acre. Cantaloupes and watermelons are sometimes grown in a small way.

Crop rotations and methods of cultivation correspond with those practiced on the main type. A few farmers report successful use of commercial fertilizers. The fertilizer generally is applied at the rate of 250 to 300 pounds per acre at the time of preparing the soil. About all the fertilizer is used for cotton. Some claim that the use of fertilizer increases the yields of cotton from one-third to one-half bale per acre.

But little attention is given to the maintenance of the productiveness of this land. There seems to be some impoverishment of the soil owing to continued cropping with little attention to crop rotations designed to maintain the organic-matter supply. There is no question but that the growing of legumes and other organic matter supplying crops, deeper plowing, and better preparation of the seed bed will increase crop yields. This has been demonstrated by the better farmers of this and other regions.

Owing to the somewhat greater productiveness and more favorable location of the low phase of the Hanceville fine sandy loam, it has a slightly higher market value than the main type. Its value ranges from $20 to $35 an acre, depending upon the improvements.

The results of mechanical analyses of samples of the soil and subsoil of the typical Hanceville fine sandy loam are given in the following table:

Mechanical analyses of Hanceville fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460715	Soil	0.1	1.0	2.6	38.1	14.6	40.0	3.6
460716	Subsoil	.0	.6	1.8	28.2	11.9	34.6	23.0

HANCEVILLE VERY FINE SANDY LOAM.

The surface soil of the Hanceville very fine sandy loam is 8 to 10 inches in depth, and consists of a brown to grayish-brown very fine sandy loam, usually quite loamy and containing a large percentage of silt and clay. The subsoil gradually becomes heavier with depth and is more yellowish, passing at about 16 inches into a yellowish-red, fairly friable clay. The clay usually continues to a depth of 36 inches or more, but occasionally the underlying shale or thin-bedded sandstone is encountered within the 3-foot section.

This soil has a fine-textured, loamy character, which may be considered intermediate between the Hanceville fine sandy loam and loam types. It usually works up mellow, and is reasonably easy to keep in good tilth. When plowed too wet it is likely to form clods.

The type has only a small total area in this county. It occurs in a rather narrow strip in the southern part of the county, bordering the Arkansas River bottom soils, and in a large area about Hector. A small area is mapped along the Conway County line a few miles southeast of Appleton.

The topography is gently rolling, and comparatively little of the type is too rough for regular and profitable cultivation. The drainage is well established, and only in a few of the lower depressions is there likely to be an excess of moisture for any considerable period.

A large part of this type is utilized for the production of the same crops as those grown on the Hanceville fine sandy loam. The yields and methods of farming are about the same.

In the following table the results of mechanical analyses of samples of the soil and subsoil of this type are given:

Mechanical analyses of Hanceville very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460727	Soil	0.0	0.4	0.5	3.3	28.9	58.3	8.5
460728	Subsoil	.0	.4	.3	3.0	26.0	55.1	15.2

HANCEVILLE LOAM.

The soil of the Hanceville loam to an average depth of about 6 inches consists of a light-brown or somewhat grayish brown mellow loam. In places the texture of this soil ranges close to a silt loam. The subsoil consists of yellowish-red to reddish-brown, fairly compact clay or silty clay, which usually becomes redder in color, approaching a brick red, with increase in depth. Below about 24 inches there is frequently some mottling of yellowish or yellowish-brown colors. In places the upper subsoil is a heavy loam, clay loam or fine sandy clay, which becomes brown below.

The soil is reasonably free from stones, and some of the more nearly level and flat locations are practically stone free. A few spots have enough stones to interfere somewhat with cultivation, but practically all the areas mapped are cultivable. Bedrock is in places reached within the 3-foot section. This is true more often where the surface is somewhat uneven, as on slopes or on some of the narrow ridges.

This soil in its typical development is encountered only in the northern Boston Mountain section of the county, and particularly east of the West Fork of the Illinois Bayou. It occupies the nearly flat mountain tops and ridges, and most of the benches. It occurs in long strips about one-fourth to one-half mile wide, and in small, isolated tracts of about 40 to 80 acres each. The larger areas of the type are of sufficient size to include several farms.

Practically all the type has a smooth, level to gently rolling surface and is well suited to cultivation. The adjoining slopes are occupied either by the Hanceville stony loam or the nonagricultural Rough stony land.

The material is derived from the weathering of the fine-grained sandstone and shaly rocks common to the northern part of the county.

Nearly all the areas mapped have been cleared of their forest growth and are more or less regularly cultivated. Some few areas support a native growth of oak, hickory, black gum, and other trees. Corn is the principal crop grown, yielding generally about 15 to 25 bushels an acre. Oats are grown to a small extent, and the yields vary from about 10 to 15 bushels an acre. Very little cotton is grown, as the altitude is too great and the slightly shorter growing season discourages the culture of this crop. Irish potatoes produce satisfactory yields, and are smooth and have good keeping qualities. They are grown on this type only in small patches. Other vegetables, such as cabbage, turnips, and beets, do well. These vegetables are not grown, however, on a commercial scale, suitable markets being too remote. Apples give good returns with proper attention. The Ben Davis is the principal variety grown. Some cowpeas and sorghum

are produced for forage, as well as cowpeas for the grain and sorghum for molasses for home use.

This soil needs fairly deep plowing and thorough preparation. A large part of the type is plowed too shallow, not much over 3 inches, and in such cases crops suffer from drought and do not develop properly.

Much of this land can be bought for $9 to $10 an acre and $15 an acre is considered a good price.

Hanceville loam, low phase.—The low phase of this type has a surface soil about 6 to 8 inches deep, consisting of a brown or reddish-brown, mellow loam which in places is quite silty, and on certain elevations often contains appreciable quantities of fine and very fine sand. This is underlain by reddish-brown silty clay which becomes dense and plastic at about 20 inches. At 24 inches and below the color is often reddish yellow, mottled with shades of brown and yellow. Both soil and subsoil in some places carry small quantities of rock and shale fragments, but these do not generally interfere with cultivation. The soil mass is usually more than 3 feet deep, and in cuts and elsewhere it is seen to rest on beds of undecomposed shale and shaly sandstone.

This low phase is confined to the smoother southern section of the county. It does not have a very extensive development in any one locality, but is distributed in rather small areas associated with the other Hanceville soils and to some extent with the Conway silt loam. One of the principal areas is about 3 miles southeast of Russellville, another about 3 miles southwest of Atkins, and another a few miles north of Atkins. Other areas are encountered along Galla Creek.

The surface is generally smooth, varying from gently rolling to rolling. Nearly all the areas are suitable for farming. The drainage is good, although in some depressions water collects after rains and stands for a time on the surface.

Like the typical development, this soil is of residual origin, being derived from shales and fine-grained sandstones.

Most of the low phase is utilized in the production of the usual crops grown in the county. Cotton and corn are the principal crops. These as a rule give good returns, varying with the condition of the soil and the care exercised in preparing the land and in handling the crop. Corn yields from about 15 to 35 bushels per acre. Cotton yields from about one-third to two-thirds bale per acre, though occasionally 1 bale or more is produced. Cowpeas are grown as a forage crop, both with the corn crop and to some extent alone for the hay. Sorghum has some importance for forage and for the sirup. Very good sweet potatoes are grown, usually in small patches for home use. In some cases yields of 150 to 200 bushels per acre are reported. Pea-

nuts are sometimes grown in a small way. The phase constitutes fair grass land, and Bermuda grass does well on it.

Cotton is grown extensively on this type. Frequently it is grown in the same field year after year, but it is sometimes alternated with corn. As the soil has more or less tendency to become compact, an increase in the organic-matter content is necessary in order to promote ease in tillage and increase the water-holding capacity. With an increased organic-matter supply, the general productiveness of the soil is greater, and commercial fertilizers are more effective.

Some of the better farms of the county are located on this type. Some of this land is held at $40 to $60 an acre. An occasional tract is valued somewhat higher, and some very slightly improved lands at correspondingly lower figures.

The results of mechanical analyses of samples of the soil and subsoil of the typical Hanceville loam are given in the following table:

Mechanical analyses of Hanceville loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460701	Soil	1.7	1.6	1.0	6.5	27.0	44.6	18.4
460702	Subsoil	1.5	1.2	.6	4.5	24.4	41.8	25.6

CONWAY SERIES.

The soils of the Conway series are yellow, with yellowish to white subsoils. Iron concretions are present throughout the soil section. In places a ferruginous hardpan is developed in the subsoil. The surface varies from gently rolling to flat, and the drainage is poorly established, water frequently standing on the surface for long periods after rains. Low mounds are common. The water table is usually near the surface. The soils appear to be derived from shales, although they are developed in close proximity to streams, sometimes having the appearance of terraces.

CONWAY SILT LOAM.

The surface soil of the Conway silt loam consists of 6 to 8 inches of a yellow or grayish-yellow silt loam, generally containing some brown mottlings. This material rests on a compact subsurface layer of heavy silt loam to silty clay loam of a yellowish to grayish color, and this in turn, at about 12 to 24 inches, upon silty clay of a yellow color mottled with gray and in places yellowish or red. The subsoil of some areas is ashy gray in color. The substratum is characteristically a very impervious heavy plastic clay of a bluish color, with

grayish and yellowish intermixed clay. Black oxide of iron concretions are of common occurrence on the surface and through the soil sections. Stones and rock fragments are not numerous, though occasionally some small chips of shale and sandstone are present. A characteristic feature of this soil type is the presence of low, dome-shaped or lenticular mounds about 3 to 5 feet high and from 10 to 75 feet in diameter. The soil material of these mounds, because of the more elevated and better drained condition, differs from the typical soil. The surface has a dark-yellow color, and the texture ranges from a silt loam to a very fine sandy loam. The subsoil has about the same texture and a yellow or buff color. Mottlings are seldom seen. Small, angular sandstone pebbles and shale fragments usually are scattered through the soil mass. The productiveness of the soil of these mounds is generally low.

Included in this type is a slightly more elevated and better-drained phase. The surface soil of this consists of a yellowish-brown, mellow silt loam about 8 inches deep, and this is underlain by a lighter colored or yellowish compact silty clay loam. Occasionally brown mottlings are present in the subsoil. This phase of the type represents an approach toward the Hanceville loam or shale loam.

The Conway silt loam is confined to the southern division of the county, and its largest and most typical areas are developed in the southern sections. The most representative of these areas is in the vicinity of Russellville. As indicated on the map, various areas of Hanceville shale loam here and there break up the continuity of this tract. Various irregular areas occur farther east about Atkins. Another fairly large area occupies a basin north of Center Valley. With relation to other soils, this type occupies an intermediate position between the various stream-bottom soils and the other upland soils of the Hanceville series.

The surface of the type is flat to undulating. Some few areas, usually at the base of the bluffs or sharply rising elevations, are sloping. Such an area occurs between Baker Creek and Dover. Very little of this soil has an elevation of more than 500 feet above sea level.

As this soil is low and flat, drainage usually is deficient, and this is the chief limiting factor in the crop-producing capacity of this soil. Drainage waters from the higher elevations settle on this type, and, not being readily carried off, render the land wet and soggy. In a few places the seepage of underground waters apparently contributes to the maintenance of this undesirable condition. Locally these poorly drained areas are called "crawfish land." Such land bakes and cracks upon drying. Better-drained developments of this soil lying at a somewhat greater elevation are not so deficient in this respect.

The material is derived from the decomposition of shales and fine-grained sandstone. Some of this soil is found in close proximity to streams, and it is probable that in these situations there is some admixture of alluvial material.

The forest growth consists mainly of sweet gum. In the more elevated and better drained areas, post and red oak are common. Various water-loving grasses and Japan clover, or lespedeza, thrive in meadows and pastures. In places Bermuda grass has become established and is an important meadow and pasture grass. Originally, it is said, portions of the type were essentially prairie, as various "oak openings" were common in the broader and more typical areas.

Practically all the better locations and many of the more poorly drained areas are used for regular cropping. The few dairy farms of the county are located mainly on this type. The soil's natural adaptability to grass renders it better suited for stock raising than most of the other soils. Corn and cotton are grown quite extensively, together with some cowpeas and sorghum. On poorly drained fields corn is likely to have a stunted and sickly appearance, and the yields range from about 10 to 25 bushels per acre. On the more elevated and better-drained locations 30 to 40 bushels are often obtained. Cotton produces a rather excessive growth of stalk, and the yields are not correspondingly high, averaging about one-third to two-thirds bale per acre. Because of the poorly drained condition of much of this land some of the fields are set aside for permanent grass lands. Usually about two cuttings a year are made, with a yield of three-fourths to 1 ton of hay per acre for each cutting. Some of this hay is marketed.

Farmers do not ordinarily practice crop rotation, except that sometimes they alternate cotton and corn and occasionally introduce cowpeas or sorghum. Land is broken with the turning plow, and unless the soil is too wet or too dry it breaks down fairly well. Handling this soil when too wet or too dry leaves the surface lumpy and cloddy and difficult to bring into a good, friable condition. A few farmers use commercial fertilizers with cotton, though this practice is not general. Where cotton produces an excess of stalk with little lint, fertilizers with a high phosphate content are beneficial.

The greatest need of this soil is proper drainage. Extensive ditching and tiling are necessary to bring the land up to its maximum producing capacity and are needed to improve its physical condition. Liberal applications of lime would undoubtedly prove beneficial.

Average land values are low. The type is valued at $10 to $25 an acre, depending upon the condition of the land, accessibility, and

nearness to market. Some land near Russellville is valued at as much as $50 an acre, but this figure is high for this soil in its usual condition.

Pope Series.

The soils of the Pope series are characterized by the brown color of the surface material and the usual light-brown color of the subsoil. They occupy the overflowed first bottoms of streams and consist of alluvial material washed entirely or largely from sandstone, shale, and related sedimentary rock soils of the Appalachian Mountain province. These soils differ from the typical Huntington soils in that they do not carry wash from limestone soils or at least have not been influenced by such material to any important degree, no limestone soils occurring in the drainage basins of the streams along which the typical Pope soils are developed.

POPE STONY LOAM.

The soil of the Pope stony loam generally is a sandy loam to loam, carrying various amounts of rounded, waterworn cobbles, which have been rolled down by torrential overflows. In places the surface is too stony for profitable cultivation, although the greater part of the type is suitable for farming. In some of the more stony areas the stones are gathered into piles or used in building fences.

The Pope stony loam is developed almost entirely in the Boston Mountain region, in association with the Pope sandy loam. It is found more generally along the upper courses of the forks of the Illinois Bayou, and in strips adjoining the streams, with the sandy loam extending farther back from the stream. The larger part of the Indian Creek first bottom is occupied by this type. Smaller isolated tracts are mapped in various other parts of the county.

This is considered a strong soil, and where it is in good condition, corn does well, often yielding as high as 50 bushels an acre. Cotton in the Indian Creek Valley produces an average of about one-half bale per acre.

POPE SANDY LOAM.

The surface soil of the Pope sandy loam to a depth of about 8 inches is a brown loamy sand or sandy loam of loose, friable structure. Below this the material consists mainly of light-brown compact sandy loam or light loam, but there is considerable variation in texture from place to place and in the vertical sections. In depressed areas, such as the courses of former channels or sloughs, the soil has a more loamy character. Bordering the main stream channel are frequently narrow strips of stony soil marking the swiftest currents of overflow waters. Where these areas are large enough to separate they have been mapped as Pope stony loam.

The Pope sandy loam is largely confined to the stream bottoms of the West, Middle and East Forks of Illinois Bayou, and to a less extent it occurs along Indian Creek. One or two small areas are mapped along Hackers Fork.

The soil materials composing this type have been washed from the sandstone and shale soils of the uplands along the upper stream courses.

Some of the lower lying tracts are subject to periodical overflow, but most of the areas are seldom overflowed except in times of exceptional floods. Drainage is good, except in a few depressions or old slough channels.

Nearly all of this type is under cultivation. It is considered a good general-purpose soil, and when properly handled produces fairly good yields of corn, cowpeas, and sorghum. Cotton is grown to a small extent, but as most of this soil is within the mountainous section of the county not enough of the type is developed to permit an extended acreage of cotton. Other adjoining soil types occupy mountain slopes and ridges, and generally being rough are not suited to this or other crops to any extent. Corn yields from about 25 to 30 bushels, with occasional fields producing as high as 40 bushels to the acre. Cotton yields from about one-third to one-half bale per acre. Vegetables and watermelons succeed as on the fine sandy loam type. Cowpeas, Johnson and Bermuda grass, oats, sorghum, and a number of other forage crops can be grown.

POPE FINE SANDY LOAM.

The Pope fine sandy loam to a depth of about 8 to 10 inches is a loamy fine sand to fine sandy loam. The typical color is a light brown, but where there is a large percentage of sand the soil is more grayish brown. The percentage of fine sand varies widely, being very high in some situations, while elsewhere the soil may be quite silty. The subsoil usually has a yellowish-brown or light-brown color. It is sometimes reddish brown, showing the influence of the adjoining Hanceville series, from which the sediments have been largely derived. The subsoil is quite variable, and at about 15 to 18 inches approximates a loamy fine sand or fine sandy loam or becomes more compact in structure, sometimes ranging from a silt loam to a silty clay loam. In addition to variation from place to place the subsoil also shows textural variations in the vertical section.

The type is most extensively developed along Big Pine Creek and the Illinois Bayou, and often occurs as a strip between the stream and a body of silt loam farther back. The soil is easily tilled, and only a light farm equipment is required, as it does not become compact. Although subject to overflow, drainage is thorough, and this results in a mealy, easily worked soil.

This type is not as strong as the Pope silt loam, and has a smaller percentage of organic matter. The chief crops grown are cotton and corn. In farming on this soil it is absolutely essential for best results to maintain the humus supply. Cotton and corn are grown almost to the exclusion of all other crops, and under continuous cultivation this light fine sandy loam soon becomes worn out. In order to maintain profitable crop yields, cowpeas or grass should be grown, so that some organic matter will be returned to the soil. The average yield of cotton per acre is about one-third to one-half bale, while 25 to 30 bushels per acre is considered a good yield for corn. The type is well adapted to such crops as radishes, cabbage, Irish potatoes, sweet potatoes, tomatoes, beets, peas, beans, and watermelons. However, with the exception of small areas near the few large towns, it is difficult to market these products.

Johnson and Bermuda grass, cowpeas, oats, and sorghum can be grown. The value of this land ranges from $40 to $60 an acre.

POPE LOAM.

The soil of the Pope loam ordinarily is not of very uniform character. The surface material to a depth of about 8 inches generally is a brown, mellow loam or silty loam, sometimes containing fine sand. Frequently the surface material to a depth of 2 or 3 inches is a brown fine sandy loam. The subsoil consists of a light-brown to slightly reddish brown silty loam, which continues downward to a depth of 3 feet or more.

This soil is of relatively small extent. It occurs along Boen, Clear, and Poe Creeks in the vicinity of Appleton, and along Ross and Mud Creeks in the neighborhood of Scottsville. There are a few other small strips in the northern part of the county.

The surface of the larger areas is reasonably smooth, but in the narrower strips it is, in places, broken by winding stream channels and occasional minor stony spots. Drainage is usually well established, although during freshets most of the type is overflowed.

The type is of alluvial origin, having been laid down in the same way that the material of the Pope silt loam and other types of this series was deposited.

The larger and smoother areas of the type are under cultivation, and are devoted mainly to corn and cotton. These crops yield about the same as on the Pope silt loam. The smaller uncultivated locations and rougher tracts are generally set aside for pasture. The type is adapted to grass, lespedeza, cowpeas, and sorghum.

POPE SILT LOAM.

The surface soil of the Pope silt loam consists of a brown mellow silt loam, about 8 to 10 inches in depth. In places the soil contains

a noticeable quantity of fine sand. The subsoil typically has a lighter brown color, and consists of compact silt loam to silty clay loam. Where the drainage is poor, the subsoil is mottled with gray below about 10 to 15 inches, and becomes grayer and more compact with depth.

This is an alluvial soil, formed by the deposition of material from flowing water over the flood plains of streams flowing through and from the sandstone and shale uplands.

The most extensive developments of the type are encountered along the Illinois Bayou, the West Fork of Point Remove Creek, and Big Pine Creek. Along these streams the type occurs as strips ranging from a few rods to a mile or more in width.

The surface of the Pope silt loam is level, and, owing to its topography and the mellow character of the soil, the type is easily prepared and cultivated.

Overflows are frequent in seasons of heavy rainfall, and crops are sometimes damaged to such an extent as to be scarcely worth harvesting. A large percentage of this land is operated by tenants, and the loss of a season's crop of cotton or corn is a serious matter.

Some parts of the type are poorly drained, and the soil of such areas is mottled with gray. This condition usually occurs at some distance back from the streams, and invariably the crops are poorer here. Such areas represent an approach toward the Atkins silt loam. The virgin soil has a high percentage of organic matter, but continuous cropping to cotton and corn slowly diminishes this content, and the yields become lighter. Almost all of this type is being farmed, and the yields are heavier than those obtained from the adjoining uplands. The native forest growth consists largely of water oak, sycamore, white oak, and post oak.

The chief crops grown are cotton and corn. There is scarcely any attempt to rotate crops. Many farmers appreciate the evils of continuous cropping to cotton, but with the present system of renting land the tenant endeavors to grow cotton as the money crop, without any effort to maintain the productiveness of the land. Cowpeas make an excellent growth. This crop is valuable both for hay and for maintaining the fertility of the soil. The average yield of cotton ranges from about one-half to two-thirds bale per acre, and in very favorable seasons 1 bale per acre is produced. The type is better adapted to the growing of corn than cotton. In many instances the yield of corn is reduced by too deep cultivation after the crop has established a good rooting system. Although the soil is of a friable nature, clods are formed when it is worked in a wet condition. The average yield of corn is about 35 bushels per acre, although yields of 50 to 60 bushels are common. Irish potatoes do

well and sweet potatoes fairly well, although these crops are not grown extensively.

A large percentage of the Pope silt loam is in need of ditching or tile drainage to carry off excess water and to lower the water table. After a heavy rain or an overflow the soil becomes waterlogged, and for the greater part of some years the ground water level remains quite close to the surface. A system of tile drains or open ditches, with the laterals 60 to 75 feet apart, would remedy this condition. The main drains can usually discharge into the near-by streams. The tile should be laid at a depth of 2 to 2½ feet below the surface, with a fall of 2 or 3 inches per 100 yards. This land is valued at $50 to $100 an acre.

Atkins Series.

The Atkins soils are characterized by the gray color of the surface material and the gray or drab, or mottled grayish-yellow and drab color, and compact, dense structure of the subsoil. These are first-bottom soils, which have poor drainage between overflows. The material consists entirely or very largely of wash from sandstone and shale or related sedimentary rock material of the Appalachian Mountain region. The Atkins series is the gray equivalent of the Pope series. The soils differ from the Holly in that very little or no limestone material is present, limestone soils being absent from the drainage basins along which the typical Atkins material occurs. This series is represented in Pope County by a single member, the Atkins silt loam.

Atkins silt loam.

The Atkins silt loam consists of a gray to mottled gray and drab silt loam, underlain at about 5 to 10 inches by compact silty clay loam to silty clay of a rather plastic, dense structure and mottled yellowish, brownish, and gray or drab color.

The type occurs as a first-bottom soil, and is derived principally from materials washed from the Hanceville and Conway soils. Overflows are frequent.

The most extensive development is in the vicinity of Point Remove Creek and south of Atkins, where the soil occurs in low, flat areas along small streams.

Drainage is very poor, and during the greater part of the year the soil is very compact, wet, and cold. Very little of the type has been cleared, most of it being covered with water oak. Several small areas are used for pasture and also for producing hay, and this seems to be the best use for the type in its present condition. The soil is well adapted to lespedeza and moisture-loving grasses. Artificial drainage is necessary before profitable farm crops can be grown.

Liberal additions of lime or ground limestone are generally beneficial on land of this kind.

Owing to its present undeveloped state and poor physical condition the value of this land is very low, and no definite price can be given.

Waynesboro Series.

The surface soils of the Waynesboro series are brown to reddish brown, with dull-red to brick-red friable subsoils. Water-rounded gravel and cobbles of sandstone, quartzite, and other rocks are of common occurrence. These soils occupy old stream terraces, which, in places, have been considerably eroded. Drainage is well established. The material is washed principally from soils derived from the sandstone, shales, and quartzites of the Appalachian Mountains. These soils differ from the Cumberland soils in that they do not contain wash from limestone soils.

WAYNESBORO STONY LOAM.

The Waynesboro stony loam is of considerably less extent in this county than the Waynesboro loam. It is found in practically similar positions and at about the same elevations. It differs from the loam in having a much higher percentage of waterworn stones and rock material scattered over the surface and throughout the soil, but otherwise the soil characteristics are about the same. It is more difficult to cultivate, although in crop-producing power it seems to differ but little from the loam.

Most of the areas mapped occur along the West Fork of Illinois Bayou. Two small areas are located along the upper course of Indian Creek, another about a mile west of Retta, and another along the East Fork of Illinois Bayou at the foot of Grapevine Mountain.

WAYNESBORO LOAM.

While there is considerable variation in its character, the soil of the Waynesboro loam ordinarily consists of a brown or slightly reddish brown, friable loam about 6 inches deep. This rests on a compact reddish clay. Rounded and waterworn stones and gravel are frequently present on the surface and in the soil mass. In the area between Russellville and Baker Creek the subsoil is slightly pinkish, in contrast with the darker red subsoils of the Hanceville series. The soil material, however, often closely resembles that of the Hanceville series, and in such cases, if it were not for the terrace position and the presence of waterworn material, it would be difficult to distinguish this soil from the Hanceville.

This type is developed as isolated fragments of terraces or remnants of former levels of the valley bottoms along the upland streams of the county. Along the Illinois Bayou and its tributaries these are usually found inside the bends of the streams or where the stream in changing direction turns more or less abruptly from one side of the valley to the other. Most of these areas are of small extent, comprising from 40 to 80 acres. Others, extending some distance along the valley, are larger. In general, the larger areas occur along the lower courses of the streams. Such areas are the one between Russellville and Baker Creek, two to the northwest of Dover, one immediately north of Scottsville, and another just south of Economy in the angle between the junction of Gumlog and Point Remove Creeks.

The soil of the area near Economy differs somewhat from the typical. The surface soil is more sandy and the subsoil usually consists of a yellowish sandy clay, more or less mottled with brown and reddish brown, with some brown and black ferruginous concretions. A part of this area is rather poorly drained.

The surface of the type varies from level and smooth to slightly undulating and sloping, varying with the extent of erosion. The elevations range from slightly above to 50 to 75 feet higher than the first bottoms of the Pope soils. Frequently along the edges of the terraces, bedrock outcrops, showing that extensive erosion has taken place since these terraces formed a part of the stream flood plain.

The Waynesboro loam possesses about the same crop value as the corresponding member of the Hanceville series. Being generally smooth and accessible, it serves to vary somewhat the soil conditions on farms including areas of this soil and areas of the adjoining Pope soils. It usually furnishes good building sites where a large part of the farm consists of some lower-lying Pope soil type. Cotton and corn are the principal crops grown.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Waynesboro loam:

Mechanical analyses of Waynesboro loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460739	Soil	1.4	1.4	1.3	15.3	16.2	46.6	17.8
460740	Subsoil	.4	.5	2.7	26.1	14.6	31.0	24.4

REINACH SERIES.

The soils of the Reinach series are chocolate red to chocolate brown. The subsoils are lighter in color and in texture than the surface

soils. The Reinach series is the terrace equivalent of the Yahola series. It has the same characteristics of color, structure, and textural variation throughout the soil section as the Yahola, the essential difference being that the Reinach soils are composed of older alluvium occupying terraces well above overflow. Enough material from the Red Beds soils is present to give the soil its characteristic chocolate-red color. These soils are well drained. Three types, the fine sand, very fine sandy loam, and silt loam are mapped in this county.

REINACH FINE SAND.

The Reinach fine sand is a light chocolate reddish brown or light chocolate brown, rather loose fine sand, which grades below into lighter colored material of about the same texture. In places thin layers or strata of silty or clayey material are found in the lower subsoil. The structure is open and porous and the water-holding capacity low.

The type is encountered only in one small development about 4 miles southeast of Atkins. It occurs as an undulating to nearly flat area on the Arkansas River terraces. In places, the surface is somewhat billowy, presenting the appearance of having been modified by wind action.

The native vegetation consists of black oak, walnut, sassafras, sand burs, and some prickly pear.

But a small part of the type is cultivated, the soil being too loose and porous to retain sufficient moisture for best results with crops. Some cotton and corn are grown in the more loamy locations, but the larger part of the type remains in pasture or supports some timber growth. Certain special crops, like melons and early truck, could be grown to good advantage. With liberal fertilization and additions of vegetable matter, good yields should be secured.

The value of this land is low, and most of it can be bought for $3 to $4 an acre.

REINACH VERY FINE SANDY LOAM.

The Reinach very fine sandy loam consists typically of a chocolate-brown to chocolate reddish brown very fine sandy loam, which, usually at about 10 to 20 inches, grades into light chocolate red, chocolate-brown or grayish loamy very fine sand, generally having a rather compact structure when dry. In occasional swales or depressions the color of the soil is darker and the drainage somewhat poorer.

The type occurs on low to moderately high terraces of the Arkansas River. Nearly all of it lies in 6 or 7 contiguous tracts south and southeast of Atkins. The surface is characteristically flat, with

the exception of an occasional faint undulation due to hummocks and sags. This soil is the second bottom equivalent of the Yahola very fine sandy loam. There is very little difference in the physical composition of the two soils, but this type stands above overflow, while the Yahola is subject to inundation. The line of separation is not always marked by a sharp bluff or slope. The type rises above the lowest terrace through a succession of steplike terraces sometimes separated by sharp rises of more than 10 or 12 feet. The greater part of the type has good drainage. Some of the depressions are in need of ditching or tiling. The soil is easily cultivated.

The Reinach very fine sandy loam is well suited to cotton and corn and to Bermuda grass, oats, peanuts, alfalfa, cowpeas, sorghum, and potatoes. Pecans undoubtedly would do well. Cotton, corn, and alfalfa are the chief crops grown.

The better phases of this land, which are well suited to alfalfa, are valued at $75 to $100 an acre. Less desirable lands are valued at $40 to $50 an acre.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Reinach very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460703	Soil	0.0	0.2	0.2	4.9	42.1	29.7	22.9
460704	Subsoil	.0	.2	.2	4.0	47.2	44.6	4.0

REINACH SILT LOAM.

The Reinach silt loam in its typical development consists of a dark chocolate red to chocolate reddish brown, or chocolate-brown, mellow silt loam, which below an average depth of 8 or 10 inches is noticeably compact when dry. At about 24 to 30 inches, lighter colored, very fine sandy loam is generally encountered. The color of the lower substratum ranges from slightly chocolate red to somewhat grayish.

The type occurs on second bottoms of the Arkansas River. It is mapped in only a few small areas, which are located south and southeast of Atkins. The surface is generally flat and nearly level, the most important variations consisting of very slight ridges and hummocks and shallow depressions or swales. The drainage, as a rule, is well established, although the depressions are in need of tiling or ditching. There is not usually a very distinct slope between this soil and the adjoining first-bottom soils of the Arkansas River, this

soil passing into the first bottoms through an almost imperceptible slope. Tillage operations are easily performed.

The type is admirably suited to cotton, corn, and forage crops. It is also adapted to oats, alfalfa, Bermuda grass, lespedeza, Irish potatoes, and cabbage. Cotton and corn are the chief crops grown.

YAHOLA SERIES.

The Yahola soils are characterized by the chocolate-red color of the surface portion, and by the lighter color and lighter texture of the subsoils. They are confined to overflowed stream bottoms. The reddish color of the material is due to the presence of sediments from the Permian Red Beds region. The Yahola soils differ from those of the Miller series in having lighter colored and lighter textured subsoils. Four members of this series are recognized in Pope County, the Yahola fine sand, very fine sand, very fine sandy loam, and silt loam.

YAHOLA FINE SAND.

The Yahola fine sand is a light chocolate reddish brown or light chocolate brown, rather loose, fine sand which grades below into a somewhat lighter-colored material of about the same texture.

The type occurs in a small tract in the first bottom of the Arkansas River as a rather flat to sloping area in the southern part of the Holly Bend. It is subject to overflow, but is well drained between overflows and rather inclined to be droughty.

This soil is best suited to cotton, corn, and cowpeas. The yields are rather low, but are easily increased by liberal fertilization.

YAHOLA VERY FINE SAND.

The surface soil of the Yahola very fine sand varies from about 8 to 12 inches in depth and consists of a loose, light, slightly chocolate reddish brown or light chocolate brown loamy very fine sand. This material gradually changes below to a lighter colored or yellowish to somewhat grayish incoherent very fine sand.

The type is developed in narrow strips and in areas adjoining or extending over low ridges or swales near the Arkansas River. Overflows occur nearly every year, and each overflow deposits some additional sand. The higher ridges or swales and some of the few more elevated areas are above normal overflow. Owing to its loose nature and the absence of an impervious substratum, the soil is well drained. Generally the drainage is excessive.

Fair corn and cotton crops and some alfalfa are grown. The soil is rather too loose for satisfactory results with general farm crops. Alfalfa, however, does well, as does Bermuda grass, which on por-

tions of the type furnishes excellent pasturage. The type is apparently well adapted to melons, cantaloupes, and early truck crops.

In the following table the results of mechanical analyses of samples of the soil and subsoil of this type are given:

Mechanical analyses of Yahola very fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460711	Soil	0.0	0.2	0.4	36.6	42.6	17.8	2.4
460712	Subsoil	.0	.1	.4	46.6	41.9	9.6	1.3

The following sample contained more than one-half of 1 per cent calcium carbonate ($CaCO_3$): No. 460711, 0.54 per cent.

YAHOLA VERY FINE SANDY LOAM.

The surface soil of the Yahola very fine sandy loam extends to a depth of 10 to 15 inches, and consists of a light-chocolate or chocolate reddish brown very fine sandy loam, which has a more or less grayish cast at the immediate surface, when dry. The subsoil is a very fine sandy loam of a light-red or light chocolate red color. Usually the upper subsoil is somewhat loamy and contains considerable clay, making the soil mass slightly cohesive. The lower subsoil, reached at 30 to 36 inches or more, generally is looser, being more nearly a fine sand of yellowish or light reddish gray color.

The type occupies the first bottoms of the Arkansas River, and all of it is more or less subject to overflow. It occurs usually in narrow strips along the river. In places narrow strips of Yahola very fine sand intervene between this type and the river. The surface is flat or nearly level to slightly undulating, varied with low, narrow ridges, hummocks, and slight depressions. Drainage is well established. The characteristic forest growth consists of sycamore, honey locust, ash, hackberry, and pecan.

While there is but little difference between the physical nature of this soil and the associated Reinach very fine sandy loam, this type is subject to overflow, and in this way its crop value is modified. Otherwise the crop value and adaptations of the two types are essentially the same. Cotton and corn are the principal crops grown. The type is adapted to alfalfa and a number of forage crops.

YAHOLA SILT LOAM.

The Yahola silt loam, so far as its physical characteristics are concerned, does not differ in any striking way from the Reinach silt loam. The chief difference is that it occupies the first bottom of the

Arkansas River, and hence is subject to overflow. The typical soil is a dark chocolate red to chocolate-brown friable silt loam, underlain by compact material of about the same character, to a depth of about 24 to 30 inches, where lighter colored very fine sandy loam is encountered. This type is not extensively developed in the county. It is found to the south of Russellville and in the Holly Bend. A few small areas occur in the extreme southeastern part of the county. For the most part it has a flat and nearly level surface, but in places is somewhat broken by slight hummocks and depressions. Nearly all of the areas mapped are well suited to cultivation and are adapted to the same crops as the Reinach silt loam. Cotton, corn, and alfalfa give good returns. Deep plowing or subsoiling to open up the compact subsurface material is beneficial.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Yahola silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460707	Soil	0.0	0.1	0.1	2.1	8.4	61.8	27.3
460708	Subsoil	.0	.1	.0	.3	17.5	62.6	19.2

BASTROP SERIES.

The soils of the Bastrop series are brown, and the subsoils are reddish brown to red. These soils consist of old alluvial material brought down by streams from the Permian Red Beds and deposited as terraces almost entirely above overflow. Only one type is encountered in this county—the Bastrop clay.

BASTROP CLAY.

Typically the Bastrop clay is a dark chocolate reddish brown, or dark chocolate red silty clay, which passes at about 10 to 15 inches into dark chocolate red, chocolate-red or chocolate reddish brown silty clay, having a more compact structure than the soil. In places the lower subsoil is somewhat yellowish brown or light reddish brown. There are some included poorly drained, depressed areas in which water is likely to stand for a large part of the year. In such places cypress trees are abundant. The soil here has a darker or more of a drab color. The most important of these depressions are shown on the map by swamp symbols.

The type occurs largely as nearly level land standing above overflow from the Arkansas River. It is developed principally in three small tracts, one in the northern part of the Holly Bend, one about

4 miles south of Atkins, and another about 5 miles southeast of this place.

The soil generally is well drained. It is very sticky when wet, but the surface soil crumbles on drying out. Heavier teams and tools are required for efficient tillage than in the case of the lighter textured soils.

The type is well suited to cotton, but not to corn. Bermuda grass and forage crops should do well. Alfalfa is being grown in places, and with proper management this crop should give heavy yields.

In the following table the results of mechanical analyses of samples of the soil and subsoil of the Bastrop clay are given:

Mechanical analyses of Bastrop clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460705	Soil	0.2	0.7	1.0	4.4	3.4	41.2	48.9
460706	Subsoil	.1	.4	.4	3.5	2.6	35.8	56.7

The following sample contained more than one-half of 1 per cent calcium carbonate ($CaCO_3$): No. 460706, 2.56 per cent.

BREWER SERIES.

The Brewer series is the terrace equivalent of the Osage. The surface soils are dark gray to black, and the subsoils drab to black, with grayish and rusty-brown mottlings. This series occupies stream terraces. The material is derived mainly from residual prairie soils. In the lower situations, the drainage is poor. Three types of the Brewer series, the very fine sandy loam, the silt loam, and the clay, are recognized in this county.

BREWER VERY FINE SANDY LOAM.

The Brewer very fine sandy loam consists of a brown or dark-brown very fine sandy loam, underlain at about 8 to 15 inches by somewhat lighter brown, compact very fine sandy loam or silty loam, which continues downward to 3 feet or more without much change. In some places, at about 30 inches, the subsoil has a slightly lighter texture and looser structure. An occasional stratum of drab-colored, waxy clay, an inch or two in thickness, is encountered.

This soil occurs in nearly every case in association with the Brewer silt loam, and always lies nearer the river than that type.

The surface features are similar to those of the Brewer silt loam soil, except that most of this type has a slightly higher elevation.

All of the type is well drained, and in its terrace position lies above overflow.

The same range of crops is grown as on the Brewer silt loam, with about the same yields. Cotton, if anything, appears to be a little more productive. Alfalfa does very well. The sandier nature of the soil makes it easier to manage and less likely to bake or become caked if worked while too wet.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Brewer very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460723	Soil	0.0	0.1	0.2	1.0	47.8	41.8	9.4
460724	Subsoil	.0	.1	.1	.8	54.4	34.6	9.8

BREWER SILT LOAM.

The typical Brewer silt loam is a dark-brown to nearly black, mellow silt loam which passes into dark-brown to nearly black silty clay loam to compact heavy silt loam. In the lower part of the 3-foot section the color changes to light brown or brown, mottled with rusty brown.

The type occupies terraces of the Arkansas River, usually away from the river and adjacent to the residual uplands. Areas of this soil are encountered south and southeast of London, south of New Hope, and about 3 miles southeast of Atkins. The surface is characteristically level, and the type is a little lower than the adjoining areas of Brewer very fine sandy loam.

The soil is easily cultivated, has good drainage, and is retentive of moisture. Cotton and corn produce good yields. Yields of one bale of cotton per acre without fertilization are common. Pecans appear to do well.

Cotton makes a good growth of stalk, and in some cases there is a tendency toward late maturity of the bolls. To improve the fruiting capacity of cotton and to correct late maturity, fertilizers high in phosphoric acid are beneficial. Acid phosphate, applied at the rate of 300 to 400 pounds per acre, has often been found helpful in this respect on similar textured soils.

Land of this type is sold for about $50 an acre. It is sometimes considered more valuable and is held at $75 to $100 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Brewer silt loam:

Mechanical analyses of Brewer silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
460725	Soil	0.0	0.1	0.2	3.0	27.4	51.5	17.7
460726	Subsoil	.0	.0	.2	5.3	29.1	42.0	23.5

BREWER CLAY.

The Brewer clay typically is a black silty clay, which grades below into slightly lighter colored or dark-drab to bluish-black, plastic, sticky silty clay. Faint mottlings of rusty brown are common. The soil is very sticky when wet.

The type occupies flat to slightly depressed areas on the Arkansas River terraces. There is usually a faint slope away from the river. The drainage is rather poor, but can be easily improved artificially.

The total area of the type is 6.1 square miles. Two small tracts are located southeast of London, another of about 4 square miles occurs about 3 miles southeast of Atkins, and another along Galla Creek near its mouth.

Forested areas of this type support a good growth of willow, oak, red oak, elm, pecan, hackberry, and sweet gum.

Heavy teams and tools are necessary to secure good seed-bed conditions. In dry seasons cotton is said to give good results. Corn does not usually do so well as on the lighter-textured members of the series. On the large area southeast of Atkins alfalfa is grown successfully.

OSAGE SERIES.

The Osage soils are dark gray to almost black. They consist of alluvial wash from the sandstone and shale soils of the prairie regions. They are poorly drained and subject to overflow. The Osage silt loam is the only member of this series mapped in Pope County.

OSAGE SILT LOAM.

The Osage silt loam consists of a dark-brown to nearly black, friable silt loam, which is underlain at 10 to 14 inches by a light-brown, rather compact silt loam. Frequently at a depth of about 3 feet the material becomes looser and loamy.

The total area of this type is small. One area is mapped south of New Hope, and a few other narrow strips in the Holly Bend. The soil has a flat, level surface, and, with the exception of the small areas which occupy depressions, has good drainage.

This soil type is developed in the first bottoms of the Arkansas River. In other respects it is the equivalent of the Brewer silt loam, which occupies the second bottoms. It has practically the same value as the Brewer silt loam.

Muskogee Series.

The Muskogee series comprises gray to grayish-brown surface soils, with yellowish, friable, and somewhat heavier subsurface material, and yellow or mottled yellow and gray, plastic heavy clay subsoils. Water-rounded chert and sandstone pebbles are of common occurrence in the subsoil and substratum. These soils consist of old alluvium. They occupy high stream terraces. The material is derived largely from residual prairie soils. Weathering has reached an advanced stage in the surface soil, but is not so complete in the subsoil material. The topography varies from flat to gently rolling, and the drainage is good. Some areas are dissected by erosion. The Muskogee series is represented only by two types, the very fine sandy loam and the silt loam, in this county.

MUSKOGEE VERY FINE SANDY LOAM.

The Muskogee very fine sandy loam is a gray to grayish-yellow very fine sandy loam, which grades below into mottled grayish and reddish or mottled grayish and yellowish, rather plastic fine sandy clay. The deep substratum consists of chocolate-red clay. There are included areas in the higher, better drained positions, near the sharp bluff line separating this type from the lower terrace soils, and near drainage-way slopes, which vary from the typical Muskogee very fine sandy loam, consisting of a grayish-brown to slightly reddish brown very fine sandy loam to loamy very fine sand which passes below into yellowish-red or red friable fine sandy clay. These areas are not separated on account of their small size. There are also some included hummocks or mounds, on which the soil consists of a grayish-brown loamy fine sand, 3 feet or nearly 3 feet deep.

Practically all of this type occurs about 3 miles south of Atkins, with a total area of 1.2 square miles. It occupies old high terraces of the Arkansas River. The drainage typically is not well established, although in places it is good. In some parts of the type fair results are had with cotton, but the typical soil is not very productive, probably being best suited to corn and oats. This soil is separated from the lower lying types by a sharp bluff, in places as high as 30 or 40 feet.

MUSKOGEE SILT LOAM.

The Muskogee silt loam is a pale-yellow silt loam, usually mottled with gray, which grades at about 6 or 8 inches into mottled gray and

yellow silty clay loam, and this in turn grades at about 12 to 15 inches into mottled gray and yellowish-red or reddish-yellow, plastic silty clay, which becomes more compact and plastic with increasing depth, the color changing to mottled gray or drab and yellow. The substratum consists of chocolate-red clay. This in places is encountered within the 3-foot section or is exposed along the slopes or drainage ways. The surface of the type is characteristically flat, but in places there are some mounds which are better drained and which include material of a more uniform color and somewhat lighter texture.

The largest area of this type occurs to the east of Atkins. The soil is also developed in narrower strips along the borders of the other river-bottom soils and lying between these and the residual upland soils. Nearly all of the type occurs in the southeastern part of the county. It occupies old high terraces of the Arkansas River. The soil is in many places poorly drained and is of low agricultural value. It is best adapted to grass and lespedeza. The greater part of this type is forested, principally with oak and hickory.

Miscellaneous Material.

RIVERWASH.

Bordering the Arkansas River in the Holly Bend is a strip of material about one-fourth to one-half mile in width, which consists of various grades of sands and some gravel. This area is overflowed during any considerable rise of the river and new materials are added. The character of the surface is more or less changed by the varying currents. Along the opposite side of the river in this bend the stream is cutting away the banks.

Owing to the frequency of overflows and the loose, incoherent character of the material, the Riverwash is practically valueless for agriculture.

ROUGH STONY LAND.

The areas mapped as Rough stony land are too stony, rough, and steep to be of any use for cultivation. In the northern mountainous section of the county they comprise the steep, rough slopes of the mountains. In the southern part of the county land of this character has a very small total area, but generally it is found in similar positions. It includes the steep, rough, and rocky slopes of the plateaulike mountains of the southern half of the county, but occurs in strips usually not over one-fourth of a mile in width. The steeper of the slopes usually have rock exposures near the top of the elevation, and scattered along the slope are quantities of large detached rock fragments which have fallen down.

In places, more particularly in the northern half of the county, there are patches of soil that might be cultivated, but these are of very small extent. The line of demarcation between this classification and the Hanceville stony loam is sometimes difficult to distinguish. The general characteristics of the soil encountered in areas of Rough stony land are similar to those of the Hanceville soils. Practically all the land is forested, principally with a scrubby growth of various species of oak and some pine, black gum, and hickory. In places scant pasturage is afforded, but the best use of these areas is for forestry.

SUMMARY.

Pope County, Ark., is situated in the northwest-central part of the State. It has an area of 828 square miles, or 529,920 acres. The northern half of the county is occupied by a section of the Boston Mountains, and the topography is rough and rugged. The southern half of the county has a lower elevation and is less dissected. A few small and more or less isolated mountains occur in this section.

Nearly all the drainage flows south into the Arkansas River, which forms the southern boundary of the county.

The county was settled largely by people from other Southern States. The population is reported in the 1910 census as 24,527. The negro population is small. Russellville, with a population of about 3,000, is the county seat and chief business center.

The St. Louis, Iron Mountain & Southern Railroad traverses the southern part of the county, but in the northern section transportation facilities are poor. The roads are kept in fair condition.

The climate is equable. The average annual precipitation is about 46 inches, and the annual mean temperature about 61° F. The growing season averages somewhat over 200 days.

Agriculture has always been the chief industry in the county. Since the Civil War cotton has become the principal crop and has so continued. While some corn, oats, wheat, sorghum, and potatoes are grown, they are produced mainly for home use. Some alfalfa is grown. The growing of fruit, particularly peaches, is becoming important. Very little dairying is practiced, but this industry offers good opportunities. Cotton and cotton seed are the most important agricultural products, and the chief markets are St. Louis, Kansas City, Memphis, and Little Rock.

Owing to the absorbing interest in cotton production little attention is given to crop rotation. Commercial fertilizers are used to some extent. There is a general need for more diversified farming, with the practice of systematic crop rotations, in order to maintain

and increase the humus content of the soils and to improve their general productiveness. In this connection the extension of dairying and stock raising is beneficial.

The soils are residual and alluvial. The former are derived from sandstones and shales and the latter from western residual prairie materials and from local alluvium.

Six upland residual soils are mapped in addition to the Rough stony land classification. Five of these belong to the Hanceville series and one to the Conway series. Of the alluvial soils of the upland, five types belong to the Pope series, one to the Atkins series, and two to the Waynesboro series. Of the Arkansas River soils 14 types besides Riverwash are mapped. These soils represent the Reinach, Yahola, Bastrop, Brewer, Osage, and Muskogee series. The stony loam, fine sandy loam, and loam of the Hanceville series each have a low phase.

The Hanceville fine sandy loam is used for the production of cotton and corn and miscellaneous crops. Fruit, particularly peaches, is an important product. The low phase is devoted to about the same crops, but has a lower elevation and is more accessible.

The Hanceville stony loam is a rough soil, but portions of it are fairly well suited for cultivation. This type is adapted to fruit growing.

The Hanceville very fine sandy loam, shale loam, and the low phase of the loam are comparatively heavy textured soils suitable for general farming. They need thorough cultivation and an increase in humus supply. The Hanceville loam, being a mountain soil, is not adapted to cotton, but produces fair crops of corn and small grains. Vegetables and fruit do well.

The Conway silt loam in general is a low, poorly drained soil not well suited in its present condition to general crops. Grass does well and stock raising could easily be conducted on it. The soil is in need of artificial drainage.

The Pope silt loam is an alluvial soil. It is well adapted to corn and cotton. Portions of the type have rather poor drainage. The Pope loam has about the same value as the silt loam.

The Pope fine sandy loam is suited to corn and cotton, vegetables, and truck crops. The soil is in need of organic matter.

The Pope sandy loam and the stony loam are well suited to corn and to some extent to cotton and miscellaneous crops. The type is so rough that cultivation is difficult, but it is considered a strong soil.

The Atkins silt loam is a poorly drained alluvial soil, which is mainly forested. Cleared areas afford some pasturage.

The Waynesboro loam and stony loam are suited to general farming.

The Reinach very fine sandy loam is an Arkansas River soil, chiefly devoted to cotton and corn. The Reinach fine sand is droughty and has a low agricultural value. The silt loam of this series is suited to cotton, corn, and forage crops.

The Yahola very fine sandy loam has practically the same value as the Reinach very fine sandy loam. The Yahola very fine sand and the fine sand are loose, porous soils inclined to be droughty. They comprise good Bermuda grass pastures, and are well adapted to vegetable and early truck crops. The Yahola silt loam gives good yields of cotton and corn.

The Bastrop clay produces fair crops of cotton, but is rather too heavy for corn. On a few better-drained fields alfalfa does well. Portions of the type are poorly drained.

The Brewer silt loam and very fine sandy loam are dark-colored soils, well suited to corn and cotton. The Brewer clay is a heavy soil, portions of which are rather poorly drained. Good crops of cotton are produced, and on the better-drained phases alfalfa makes a good growth.

The Osage silt loam has about the same value as the Brewer silt loam.

The Muskogee silt loam and very fine sandy loam are high-terrace soils fairly well suited to general crops.

Rough stony land is a nonagricultural type, suitable only for forestry.

Riverwash is of small extent and has no present agricultural value.

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U. S. DEPT OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF
CURTIS F MARBUT IN CHARGE SOIL SURVEY

SOIL MAP

ARKANSAS
POPE COUNTY SHEET

SOIL PROFILE
(3 feet deep)

- Hanceville loam — L, C
- Yahola fine sand — Fs, Fs
- Yahola very fine sand — Lfs, Fs — Low phase
- Hanceville stony loam — L, C
- Yahola very fine sandy loam — Vfsl, Vfs — Low phase
- Hanceville shale loam — L, C
- Yahola silt loam — Sil, Vfsl — Low phase
- Hanceville fine sandy loam — Fsl, C
- Waynesboro loam — L, C
- Waynesboro stony loam — L, C
- Brewer very fine sandy loam — Vfsl, Vfsl — Low phase
- Hanceville very fine sandy loam — Vfsl, C
- Brewer silt loam — Sil, Sil
- Pope loam — L, L
- Brewer clay — C, C
- Pope stony loam — L, L
- Muskogee very fine sandy loam — Vfsl, Fsc
- Pope sandy loam — Sl, Sl
- Muskogee silt loam — Sil, Sicl
- Pope fine sandy loam — Fsl, Fsl
- Conway silt loam — Sil, Sicl to C
- Pope silt loam — Sil, Sil to Sicl
- Atkins silt loam — Sil, Sicl
- Reinach fine sand — Lfs, Fs
- Bastrop clay — C, C
- Reinach very fine sandy loam — Vfsl, Vfs
- Osage silt loam — Sil, Sil
- Reinach silt loam — Sil, Sil, Vfsl

LEGEND

Vfsl	Very fine sandy loam
Fsl	Fine sandy loam
Sicl	Silty clay loam
Vfs	Very fine sand
Vfc	Very fine clay
Sil	Silt loam
Lfs	Loamy fine sand
Sl	Sandy loam
Fs	Fine sand
L	Loam
C	Clay

LEGEND

- Hanceville loam — HI
- Yahola fine sand — Ys
- Yahola very fine sand — Yv
- HI — Low phase
- Hanceville stony loam — Hs
- Yahola very fine sandy loam — Yf
- Hs — Low phase
- Yahola silt loam — Yl
- Hanceville shale loam — H
- Waynesboro loam — Wl
- Hanceville fine sandy loam — Hf
- Waynesboro stony loam — Ws
- Hf — Low phase
- Brewer very fine sandy loam — Bv
- Hanceville very fine sandy loam — Hv
- Brewer silt loam — Bl
- Pope loam — Pl
- Brewer clay — B
- Pope stony loam — Ps
- Muskogee very fine sandy loam — Mv
- Pope sandy loam — Po
- Muskogee silt loam — Ms
- Pope fine sandy loam — Pf
- Conway silt loam — Cs
- Pope silt loam — P
- Atkins silt loam — Al
- Reinach fine sand — Rf
- Bastrop clay — Bc
- Reinach very fine sandy loam — Rv
- Osage silt loam — Ol
- Reinach silt loam — Rs
- Rough stony land — R
- Riverwash — Rw

CONVENTIONAL SIGNS

CULTURE
(printed in black)

- City or Village, Roads, Buildings, Wharves, Jetties, Breakwater, Levee, Lighthouse, Fort.
- Secondary roads and Trails
- Railroads Steam and Electric
- Bridges, Ferry
- R. R. crossings, Tunnel
- Ford, Dam
- School or Church Cemeteries
- Mine or Quarry Mine dumps Made land
- Bluff, Escarpment, Rock outcrop and Triangulation station
- Stony and Gravelly areas
- Soil boundaries Oil wells and tanks
- Boundary lines
- Boundary lines
- Boundary lines
- U. S. township and section lines

RELIEF
(printed in brown or black)

- Contours Depression contours
- Prominent Hills Mountain Peaks
- Sand, Wash, and Sand dunes
- Shore and Low-water line, Sandbar

DRAINAGE
(printed in blue)

- Streams
- Lakes, Ponds, Intermittent lakes
- Intermittent streams
- Springs, Canals and Ditches, Flumes
- Fresh marsh Salt marshes
- Submerged marsh Tidal flats
- Salt and Fresh marsh *(Fresh marsh predominating)*

The above signs are in current use on the soil maps. Variations from this usage appear in some maps of earlier dates.

Hugh H. Bennett, Inspector Southern Division
Soils surveyed by Clarence Lounsbury and E.B. Deeter.

BASE MAP IN PART FROM
U.S. GEOLOGICAL SURVEY SHEETS

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1913